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Energy Minimization; 2.4 Nonideal Behavior
2.4.1 Gas Phase 2.4.2 Vapor-Liquid Phases; References; 3 Fluid Flow Equipment; 3.1 Fundamentals of Fluid Flow; 3.1.1 Flow Regimes; 3.1.2 Extended Bernoulli Equation; 3.2 Single-Phase Incompressible Flow; 3.2.1 Pressure Drop in Pipes; 3.2.2 Pressure Drop in Fittings; 3.3 Single-Phase Compressible Flow; 3.3.1 Pressure Drop in Pipes and Fittings; 3.3.2 Choked Flow; 3.4 Two-Phase Fluid Flow; 3.4.1 Gas-Liquid Flow Regimes; 3.4.2 Pressure Drop in Pipes and Fittings; 3.4.3 Droplet Separation; 3.5 Solid fluid Systems; 3.5.1 Flow Regimes; 3.5.2 Pressure Drop; 3.5.3 Pneumatic Conveying
3.6 Fluid Velocity in Pipes 3.7 Turbomachinery; 3.7.1 Pumps; 3.7.1.1 Centrifugal Pumps; 3.7.1.2 Axial Pumps; 3.7.1.3 Rotary Pumps; 3.7.1.4 Reciprocating Pumps; 3.7.1.5 Specific Speed; 3.7.1.6 Net Positive Suction Head; 3.7.1.7 Pumping Power; 3.7.1.8 System Requirements and Pump Characteristics; 3.7.2 Compressors; 3.7.2.1 Centrifugal Compressors; 3.7.2.2 Axial Compressors; 3.7.2.3 Reciprocating Compressors; 3.7.2.4 Rotary Screw Compressors; 3.7.2.5 System Requirements and Compressor Characteristics; 3.7.2.6 Compression Power and Intercooling; 3.7.3 Fans and Blowers; 3.7.4 Expansion Turbines
3.7.4.1 Expansion Power and ReheatReferences; 4 Heat Transfer Equipment; 4.1 Fundamentals of Heat Transfer; 4.1.1 Conduction; 4.1.2 Convection; 4.1.2.1 Heat Transfer by Free Convection from Vertical and Horizontal Flat Surfaces; 4.1.2.2 Heat Transfer by Free Convection from Horizontal Pipes; 4.1.2.3 Heat Transfer by Forced Convection through a Tube; 4.1.2.4 Heat Transfer by Forced Convection over a Bank of Tubes; 4.1.2.5 Heat Transfer by Condensation outside a Tube; 4.1.2.6 Heat Transfer by Boiling outside a Tube; 4.1.2.7 Heat Transfer by Boiling inside a Tube
4.1.2.8 Heat Transfer from Tubes with Fins

Sommario/riassunto

Comprehensive and a fundamental approach to the study of sustainable fuel conversion for the generation of electricity and for co-producing synthetic fuels and chemicals Both electricity and chemicals are critical to maintain our modern way of life however environmental impacts have to be factored in to sustain this type of lifestyle. Sustainable Energy Conversion for Electricity and Co-products provides a unified, comprehensive and a fundamental approach to the study of sustainable fuel conversion in order to generate electricity and optionally coproduce synthetic fuels and chemicals.